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To which may be added, the Trials of putting in a Vial full of water, some of those Herbs that will shoot and grow in water alone, including them in such a Receiver, and pumping out what Air you can, to see whether they will then shoot, or not?

And though some of these *Proposals* have been formerly begun to be Experimented, yet ought they to be diligently prosecuted, to see how far the Air is necessary to Vegetation; and whether Plants do indeed live as much upon the Air, as the Earth; and the Branches of them are rooted (as it were) *in* and quickned by the Air, as their Roots are planted and nourisht in and by the Earth?

The Experiment heretofore made of this kinde, was, That some Lettice-seed being sown upon some Earth in the open Air; and some of the same Seed at the same time upon other Earth in a Glas-Rceiver of the above mention'd Engine, afterwards exhausted of Air; the Seed exposed to the Air was grown up an inch and a half high, within eight days; but that in the exhausted Receiver, not at all. And, Air being again admitted into the said emptied Receiver, to see whether any of the Seed would then come up; it was found, that in the space of one week it was grown up to the height of two or three Inches.

### OBSERVATIONS

Concerning *Emmets* or *Ants*, their Eggs, Production, Progress, coming to Maturity, Use, &c.

*This was communicated by Doctor Edmund King, Fellow of the R. Society, at the Instance of the Publisher, as followeth.*

1. **T**here have occurr'd to my Observation but three sorts of *Ants*, commonly without Wings; *vid.* Very *Black*, *Dark Brown*, and the third sort of near the colour usually call'd *Philemorts*.

2. Each kind inhabit by themselves in their several Banks; two sorts seldom or never being found together; and if either of the other two sorts be put into the black Ants Bank, 'tis worth observing, what enmity there is betwixt these little Creatures, and with what violence the *Black* ones will seize on the *Red*, never leaving to pinch them on the head with their *Forceps* or Claws, till they have kill'd them upon the place: which done, they will car-

ry them dead out of the Field, from their Bank. But if you put *Black* Ants into a Bank of the *Red*, the Black seem to be so sensible of the strangeness of the place they are in, that there they will not meddle with the Red, but as if they were frightened, and concerned for nothing but self-preservation, run away.

3. Upon opening of these Banks, I observe first a *white substance*, which to the bare eye looks like the scatterings of fine white Sugar or Salt, but very soft and tender; and if you take a bit of it, as big perhaps as a Mustard-seed, and lay it on the Object-plate of a good *Microscope*, you may by opening it with the point of a Needle, discern many pure, white and clear appearances in distinct Membrans, all figur'd like the lesser sort of Birds Eggs, and as clear as a Fishes Bladder. This same substance as it hath been just now described, I finde in the Ants themselves, which I take to be the true *Ants Eggs*; it being obvious to observation, that where ever this is uncover'd, they make it their busines to carry it away in their mouths to secure it, and will after you have scatter'd it, lay it on a heap again with what speed they can.

4. I observe they lie in multitudes upon this (if I may so call it) *Spawn* of theirs; and after a little time, every one of these small adherances is turn'd into a little Vermicle, as small as a Mite, hardly discerned to stir; but after a few days more, you may perceive a feeble motion of flexion and extenſion, and they begin to look yellowish and hairy, shaped very like a small Maggot; and so, keeping that shape, grow almost as big as an Ant, and have every one a black spot on them.

5. Then they get a *Film* over them, whitish, and of an Oval shape, for which reason I suppose they are commonly call'd *Ants Eggs*, which yet (to speak properly) they are not.

6. I have, to prevent mistakes, opened many of these vulgarly call'd *Ants Eggs*, I mean, the lesser sort, (for there are some as big as a Wheat-corn, others less then a Rye-corn) and in *some* I finde onely a Maggot, to appearance just such as was described before: In *others*, I finde a Maggot beginning to put on the shape of an Ant about the head, with two little yellowy specks where the Eyes are design'd: In *others*, a further progress, and furnisht with every thing to compleat the shape of an Ant, but wholly transparent, the Eyes onely excepted, which are then as black as black Bugles.

7. But when they have newly put on this shape, I could never discern the least motion in any one part of the little Creature, whereof the reason may perhaps be, the weakness of their Fibres; for after a little more time, when they begin to be brownish, they have strength to stir all their parts.

8. At last I met with some of these reputed Eggs, which being carefully open'd by me, I took out of several of them, every way perfect and compleat Ants, which did immediately creep about among the rest, no way differing from many other Ants, but by a more feeble motion of their Limbs. And this I took for a clear demonstration of what I designed, which was to know, That the Film does onely cover the Maggot, while she is transforming into an Ant, and fit to shift for her self.

9. The *black Speck* that is at one end of every such reputed Ants Egg, I suppose to be cast out of the Maggot in her transformation; since, after it puts on the shape of an Ant, the Speck is quite gone, and the whole body of the Ant pure clear; since also this Speck at the end of the said Egg, lies always close to the *Anus* of the included Ant.

10. As to their care for their *Young* (by which I mean all the sorts and degrees aforesaid, from the Spawn to the vulgarly call'd Eggs, in every one of which you'll finde a young Ant) it is observable, How upon the breaking up of their Banks, they make it their busines immediately to carry their Young out of sight again, laying the several sorts of them in several places and heaps: the which if you mingle again or scatter, you shall, laying but some bits of Slate, or the like, in any place they may come to and get under, after a few hours see all the Vermicles, and vulgarly call'd Eggs, laid in their several and distinct parcels, under such pieces of Slate, &c. Provided the place be not so cold as to chill their Limbs; which if it be, by being brought to the fire they will soon recover their strength, and fall to their busines again, of securing their little Ones.

11. I have observed in Summer, That in the Morning they bring up those of their Young (that are vulgarly call'd Ants Eggs) towards the top of the Bank; so that you may from Ten in the Morning, until Five or Six Afternoon, finde them near the top; especially about One, Two, or Three of the Clock, and later, if the Weather

be hot, when for the most part they are found on the South-side of the Bank : that towards Seven or Eight at Night, if it be cool, or likely to rain, you may dig a foot deep before you can finde them.

They know all the sorts of their Young so well, that you cannot deceive them, though you may with fine Sugar, Salt, or the Crums of very white stale Bread, scatter'd in the Mould, where their first true Eggs are ( as I call them ) be mistaken your self, yet the Ants will not, nor touch a bit of what is not their own Off-spring.

13. I cannot pass by the *Use* of *Ants* in feeding young Pheasants and Partridges, they being the principal Food of these Birds, both wilde and tamed, for several weeks, as is well known to all that are versed in breeding them up. And a chief reason, why many finde it so nice a thing to breed up the said Birds, is, that either they give them too sparingly of this Food, or let them fast too long, not knowing, that as soon 'tis day-light, they will seek it for their Breakfast, and if they want it, will in a few hours be faint and weak, and some grow so chill for want of that supply of Nourishment, that it is no easie matter to recover them.

14. But ( to add this by the by ) Though these Insects be so good a Food to these Birds, whilst very young ; yet when by ill ordering of those that should keep them sweet, and often shift their water, or by ill Dyt, as musty Corn, &c. they grow sick ; then Ants will not always recover them, though you give them never so many : And I have been forced to make use of other Insects to cure them, to wit of *Millepedes* and *Earnwigs*, either of which will do good, but both together, better ; given in a good quantity, two or three times, at least, a day ; but then those other things must be observed too, of keeping their House clean, and giving them sweet Corn, and shifting their water twice a day, keeping them within, till the Dew be from the ground, letting them bask in Sand, partly in the Sun, the place a little shaded, and putting them up in a warm house before Sun-set.

Which particular I thought not amiss to add for those that delight in breeding up *Pheasants* and *Partridges*, my self having lost many of both sorts, till I learned that Vertue of those Insects ; after which, seldom any of them, by me intended to be bred up, have died.